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IX. *Descriptions of four new Species of Fucus. : By Dawson Turner,*  
M. A. F. L. S.

Read May 5, 1801.

ALTHOUGH the numerous individuals comprehended under that extensive family known by the name of *Fucus*, and especially such of them as are considered natives of Britain, have of late years been the subject of much inquiry, and have induced many most able botanists to exert their skill in the investigation of them, it nevertheless requires but a very slight acquaintance with the subject, to be fully persuaded that, without entering into laborious researches upon their internal organization, or the mode of their fructification, things hitherto almost entirely neglected, a wide field remains for future naturalists to display their ingenuity, in the determination of many even of those species which are most abundant upon every part of our Island. I should feel extremely sorry were this, or any similar observation, to be considered as detracting from the merits of those gentlemen, to whose exertions I have always had a pleasure in acknowledging that the science is most deeply indebted:—far from such an idea, my intention is only to say that our knowledge of the marine *algæ* is still in its infancy; and a stronger proof of the justice of this remark can hardly be adduced, than the common *Fucus vesiculosus*, from the varying appearances of which, Linnæus and some subsequent botanists have formed such an infinity of distinct species. Did this circumstance require further confirmation, it might possibly in some degree receive it from a consideration of the

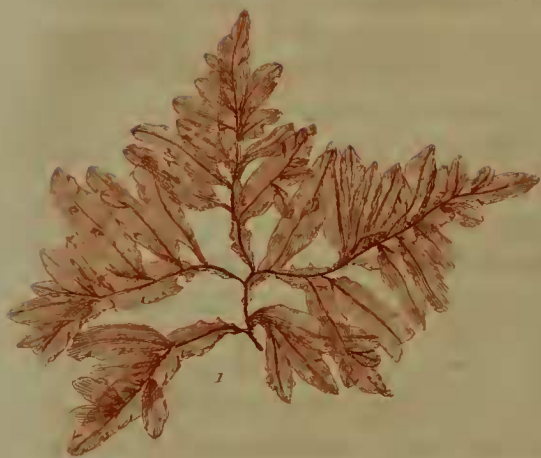
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four plants to which it is my object, in the present paper, to call the attention of the Linnæan Society, and of which two only can properly be said to be either altogether new, or even very uncommon; there being little doubt but the others will be found to be sufficiently abundant, at least upon the eastern shore of England, where their having remained so long unnoticed has arisen only from their having been regarded as varieties of some of their congeners, to which they are in reality very nearly allied. From these authors I should not now venture so openly to differ, or rather should express my sentiments with far greater diffidence, were not the plants which I have undertaken to describe, and upon which I trust that future investigators will confirm my decision, especially natives of the Yarmouth beach; and had not my attention been particularly directed to them, from almost the earliest period that I have made the marine algæ my study, by my instructor and coadjutor Mr. Wigg, upon whose knowledge of them the Society have heard too much from more able as well as more eminent botanists, to make it necessary for me in any wise to enlarge.

I had proposed to myself to extend this paper to a greater length than my contracted leisure will now admit, and, among other plants, to have included in it a figure of *Fucus fruticulosus* of Jacquin, which, in company with Mr. Sowerby, I found not unfrequently upon the shores of the more western counties; the excellent account however of this plant, given by the Baron de Wulfen, made such an intention useless; and I am now induced to mention the circumstance, only from a fear that my having abandoned the idea may have been the cause of leading my friend, Mr. Stackhouse, into error, as, I understand that, in the third fasciculus of his *Nereis*, the appearance of which may soon be expected, he has declined figuring this species from an idea that it would previously be done by me.

Fucus





*Fucus vesiculosus*



*Fucus erinulatus*

*Fucus ruscifolius*.

*F.* caule ramoso alato; foliis oblongis obtusis planis integerrimis proliferis: venulis diaphanis catenatis.

TAB. VIII.

Fig. 1. Planta naturali magnitudine.

2. Folii capsuliferi extremitas lente aucta.

Inter rejectamenta maris apud Yarmouth in Norfolciâ. Perennis:  
Floret Januario Februario.

Radix fibroso-callosa, furculifera. Frons bipollicaris, membranacea, tenerrima, e basi ramosa, caule nonnunquam brevi tereti filiformi prædita. Rami membranâ tenuissimâ utrinque alati. Folia in omnibus quæ adhuc mihi videre contigit exemplaribus, principio ovata, dein oblonga, semper obtusa; e costâ iterum atque iterum prolifera. A *Fuco Hypoglosso*, cui proximè accedit, primo intuitu dignosci potest, non modo foliorum figurâ, verùm etiam structurâ totâ internâ, præsertimque lineis pellucidis, catenatis, plerumque simplicibus, quandoque ramosis et anastomosantibus, quæ a costâ utrinque copiose oriuntur, et ad foliorum margines decurrunt, angulum cum costâ plûs minûs acutum servantes. Fructificatio, tubercula parva, globosa, in ipsâ costâ, præcipuè foliorum extremitatem versûs sita, quorum plurima sæpe in eodem folio: his dissilientibus, seminum minimorum, saturatè rubentium copia satis ampla ejicitur, et costæ utrique lateri, seriatim quasi disposita, adhæret. Color plantæ sanguineus.

The resemblance of this plant to *Fucus Hypoglossum* is so extremely great, that, though I have been in the habit of observing it for many successive years, and can point out several circumstances in

which they essentially differ, I should still have felt very unwilling to describe them as specifically distinct, were it not for the curious lines of concatenated veins which I find both peculiar to this species, and constant in all the specimens that have fallen under my observation. In a fresh state these veins are so easily visible, as to give the plant a striated appearance; but when dried, especially if fastened upon paper, a good glass and strong light are necessary to discover them. I have never been able to form a satisfactory opinion upon the office which they are intended to perform in the internal organization of the species; nor indeed is this a subject upon which, in our present knowledge of the marine algæ, it would be right to hazard a conjecture. I shall therefore content myself with observing, that they run from the midrib to the sides of the leaf generally in parallel lines, but sometimes branching and anastomosing; that they are quite pellucid; and that they are intersected at regular distances with joints, like the filaments of *Conseruæ*. The colour of *Fucus ruscifolius* is always much darker than that of *Fucus Hypoglossum*; the leaves of a different form, and, particularly when young, very blunt; the texture of the membrane, under a powerful microscope, dissimilar; the stem far stronger; and the midrib more prominent as well as more visible: to which is to be added, that the months of January and February are those in which this plant bears its fruit, and in which it is most frequently seen upon the Yarmouth beach; whereas *Fucus Hypoglossum* fructifies only in the summer, and never appears at any other part of the year. Hence I conclude, that the one is annual, the other perennial. I have a specimen of *Fucus ruscifolius* with the root completely fibrous; no tendency to which I ever saw in *Fucus Hypoglossum*; but, this not appearing to be always the case, I have not considered a single instance sufficiently important to ground any part of the specific distinction upon it. In the mode of fructifying, the two plants completely agree; and, as



much has been already written upon that subject, the Society will perhaps excuse me if I trespass somewhat upon their time by a slight digression respecting it. The fruit of *Fucus Hypoglossum*, as is well known, is sometimes found in small globular capsules situated upon the midrib of the leaves, while in other specimens no traces of these capsules are apparent, but minute dark seeds are discovered in two small rows on each side of the midrib, and parallel to it: a circumstance which with some botanists has given rise to the conjecture that this *Fucus* may possibly be dioicous, while others have carried the matter so far as to wish to constitute two distinct species. The latter idea however is done away by plants being occasionally found in which both kinds of fructification, as they are called, may be discovered upon the same plant; and the former supposition has always appeared to me equally ill-founded, from my once having examined a plant in which the capsule was actually bursting, and the seeds partly discharged. I have no hesitation in owning, that I never could account for these seeds, supposing them to be casually scattered, adhering in such regular lines as is always the case; nor can I see any reason for that part of the membrane upon which they are disposed being of a darker colour, and apparently thicker substance, than the rest of the leaf: these are difficulties which I hope other botanists will remove, but which do not appear to me of sufficient importance to induce me to accede to the idea of *Fuci* being monoicous or dioicous. I am indeed on the contrary persuaded that they prove nothing, as many other *Fuci*, among which are to be enumerated the following, have their seeds equally contained in capsules, and afterwards dispersed upon the frond, though without the same appearance of regularity: these are *Fucus alatus*, *ovalis*, *dasyphyllus*, *articulatus*, *kaliformis*, *clavellus*, *tenuissimus*, and *pinnatifidus*. From a consideration of these and other circumstances, I have been led to conjecture, that in the above-mentioned

Fuci the capsules, when mature, burst, and immediately die away; while the seeds, from that viscosity which they are known so eminently to possess, adhere to the surface of the frond, till, upon the whole plant at the end of autumn passing into decay, they attach themselves to the stems of the larger species, or rocks, as the force of the sea carries them, and there remain fixed till the latter months of the following spring again awake their vegetative powers.

Excepting *Fucus Hypoglossum* there is none in the British list with which *Fucus ruscifolius* can possibly be confounded, and I shall therefore trouble the Society with no more upon the subject.

*Fucus crenulatus.*

F. fronde planâ coriaceâ lineari dichotomâ; ramorum apicibus bifurcis oblongo-lanceolatis.

TAB. VIII.

Fig. 3. Planta naturali magnitudine.

4. Frondis apex lente auctus.

Habitat prope Durium flumen in Lusitaniæ littoribus;  $\beta$  apud Dubrem. D. L. W. Dillwyn.

Perennis? Floret Augusto, Septembri.

Radix callus expansus, fibrarum aliquot crassiuscularum rudimentis plerumque instructus. Frondes plurimæ, vix palmares, planæ, enerves, stipiti brevi, tereti insidentes, latè expansæ, undique dichotomæ, lineares, singulari modo, præsertim extremitates versùs, obtusè, sed et minutissimè crenatæ. Apices bifidi, angulis acutis, in lobos oblongo-lanceolatos desinentes. Rami plurimi, nunquam proliferi. Fructificatio tubercula hemisphærica, magnitudine feminis



minis rapæ, verrucosa, pallidè rubentia, feminibus repleta, utrique frondis paginæ insidentia. Substantia coriacea. Color e fusco saturatè sanguineus, fugacissimus, et in fordido-flavescentem transiens.

Var.  $\beta$ . substantiâ tenuiore, margine integro, apicibus plerumque obtusissimis.

In selecting for description this Portuguese Fucus, in preference to many more beautiful as well as more rare species, which my friends have been so obliging as to procure for me from foreign shores, I am actuated principally by the hope that it may thereby be in my power to throw some light upon the botany of my own country; what I consider a variety of this having been found abundantly at Dover by my friend Mr. L. W. Dillwyn, and by him obligingly communicated to me in the course of the last autumn. When this plant becomes more generally known and understood, it may probably admit of well-founded discussion how far what I have now made a variety may not in reality be a distinct species; and I have little doubt but almost every botanist, who has only an opportunity of examining them in a dry state, will immediately decide in favour of the latter opinion. For my own part, I can only say that I have had many specimens of each under my observation, and that, after having frequently examined and compared them as attentively as was in my power, I could find no permanent difference between them; though the English plant is strikingly dissimilar at first sight, in having the edges of the frond far more entire, the ends generally blunt and frequently emarginate, but neither of these are constant, and the angles of the forks much less acute. The final determination of this point must be reserved for future investigation: it is sufficient for my purpose here to show how this species differs from its congeners. *Fucus crenulatus* was brought me in such quantity

from Oporto by a gentleman who gathered it there in the month of September 1798, that I can have very little doubt of its being one of the most common weeds of that shore. It is altogether a connecting link between two species, by no means nearly allied to each other, *Fucus crispus* and *Fucus rubens*, with each of which it has many points in common, though sufficiently removed from the one as well as the other. It agrees in texture and substance with the former, and in general habit with the latter, but may at first sight be with ease distinguished from both by the branches always preserving their linear form, and being divided at the extremities in a manner somewhat similar to those of *Fucus bifidus*. The colour too, as far as I have observed, differs from that of every other British *Fucus*; of a dark red, inclining to brown, most rapidly changing, if exposed to the air or kept in fresh water, to a dull dirty yellow: my Dover specimens, when placed in a strong light, are of a fine pink at the end of the frond. But the most striking peculiarities of this species are the minutely crenulated edges, which cannot fail of being remarked by the most inattentive observer, and the fructification, which consists of pale flesh-coloured tubercles of the size of a pin's head, plentifully scattered upon each side of the frond, especially towards the extremities, in their earliest stage immersed, but soon bursting through the epidermis, and not continuing covered with it, as in all other species with which I am acquainted except *Fucus radiatus*, sessile, of a substance inclining to spongy, and very different from the rest of this plant: when dry they turn to a dark brown, and entirely lose their natural appearance. The habit of this *Fucus* in a fresh state appears to me to be much twisted, and in some branches almost spiral. From analogy I have no hesitation in concluding that it is perennial, and Mr. Dillwyn's specimens as well as those brought me from Oporto leave no doubt as to its fructifying in the autumnal months.

*Fucus.*





*Fucus aculeatus*